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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/693,028	10/23/2003	Eric C. Hannah	042390.P11816D	1760

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EXAMINER

BORIN, MICHAEL L

ART UNIT	PAPER NUMBER
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1631

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/693,028

Applicant(s)

HANNAH, ERIC C.

Examiner

Michael Borin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>09/18/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. Amendment filed 10/06/2006 is acknowledged. Claim 14 is added. Claims pending are 1-14.

Rejections not reiterated from previous Office actions are hereby withdrawn. The following rejections constitute the complete set presently being applied to the instant application.

Claim Rejections - 35 U.S.C. § 101 (non-statutory invention)

2. Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 10-14,22-29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In view of the amendment to the claims the rejection is modified as follows.

The claims are directed to a computational method of determining a three-dimensional structure. Examiner must determine if the instant claims include a useful, concrete, and tangible result. In determining if the claimed subject matter produces a useful, concrete, and tangible result, the Examiner must determine each standard individually. Furthermore, the claims must be limited only to statutory embodiments.

(1) "USEFUL RESULT"

In the instant case, claims 1-14 fail to be limited to statutory embodiments. The scope of the claims includes embodiments wherein the structure produced by the method is not as useful result. As stated in the utility rejection in the preceding Office action, the instant method lacks substantial utility because it would require further research to determine whether the configurations determined thereby has any relevance to real world native structures.

The reference of Orengo et al was cited as stating that

“Predicting the 3-D structure of a protein without the assistance of structural data from evolutionary relatives or analogous protein folds is hardest category in CASP experiment. Except in a small percentage of predictions, the final model was far too distant from the native structure ...”

In response to the above argument, applicant acknowledges that looking at the above reference of Orengo one would conclude that even such computational methods do not work for complex protein structures, “the techniques seemingly work much better for easy targets”, such as “extremely small proteins”.

Therefore, it is clear that the claimed computational method can, at best, be useful for some embodiments, and it includes embodiments which can not be considered as a useful result. As such, the claims are directed to non-statutory subject matter.

(2) "TANGIBLE RESULT"

The claim is amended to include output of three-dimensional structure on machine-readable medium. As such, the claims satisfy the “tangible result” criteria.

(3) **"CONCRETE RESULT"**

As stated in the rejection of record, the instant case, the method seems to be concrete in that, for a given secondary structure it would "predict" a tertiary structure. However, as the set of topomers used to model secondary structure onto seems to be a random set of general protein topologies (see paragraphs [0063]-[0064]) and the secondary structure seems to be determined based on a random choice of amino acid residues (see Fig.2), the result of such determining seems to be "is unrepeatable and unpredictable. Thus the result does not seem to be "concrete".

Applicant did not provide arguments to this part of rejection.

Thus, the final result achieved by the claimed invention produces a result which does not satisfy all three criteria of being useful, and concrete, and tangible.

Claim Rejections - 35 USC § 102 and 103

3. Claims 1-4,7,8 are rejected under 35 U.S.C. 102(b) as being anticipated by Monge et al. or Freisner et al.

The rejection is maintained for the reasons of record. With respect to the added limitation of "annealing the predicted secondary structures", Freisner teaches that the referenced method

further provides an algorithm which makes use of the assigned secondary structure to construct a representation of the molecule where helices and loops are described by cylinders and spheres respectively. Correspondence with the residue conformations is maintained by using loop geometries from a list of structures calculated using the allowed dihedral angles in segments of the appropriate length. The optimization as practiced herein consists of a Monte Carlo simulated annealing procedure

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combined with a genetic algorithm in which additional structures are generated by combining different members of the ensemble.

Monge reference similarly teach annealing; see, e.g., p. 5027, last paragraph.

Response to argument

Applicant did not present any particular argument.

4. Claims 2-14 are rejected under 35 U.S.C. 103(a) as unpatentable over Monge et al. or Freisner et al., and further in view of Evans et al. and Andricioaei or Zhou et, and Debe et al. and Sadanobu et al.

The rejection is maintained for the reasons of record. Examiner maintains that, if there are any differences between Applicant's claimed methods and that of the prior art, the differences would be appear minor in nature. The methods used at particular steps of the instant invention are well known in the art and their use would have been obvious to one of ordinary skill in the art at the time Applicants' invention was made.

Conclusion.

5. No claims are allowed

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Borin whose telephone number is (571) 272-0713. The examiner can normally be reached on 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Michael Borin, Ph.D.

Primary Examiner

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A handwritten signature in black ink, appearing to read 'Michael Borin', is positioned to the left of the printed name and title.

mlb